Rotary Kinetic Tangential Pump

Abstract: A kinetic pump has a tangential axially inner inlet means and a tangential discharge and with a rotor having vanes forming fluid channels to move fluid from inlet to discharge. Unlike centrifugal pumps, the volute is eliminated or restricted only to the discharge port sector, and the vanes, hence fluid channels, are oriented so as to be tangent to the inlet port axial cylindrical fluid entry zone. The removal of the volute makes the pump to be positive displacement, since the fluid is contained within the chambers enclosed by vanes, except for when passing the discharge port. The tangential orientation of the vanes allows the fluid, driven by atmospheric pressure to enter the chambers and fill the chambers both by the NPSH and by centrifugal force. The boundaries to the chambers are the fluid passages, and at the axial inner chamber surface by a cylindrical isobar formed by the divergent centrifugal force field, and at the axially outer surface, by an isobar corresponding to the outer distance from the axis at the tangential discharge port. This allows the pump to be filled by NPSH and gain rotational energy from the rotor, resulting in a focused tangential discharge of high velocity. By making the pump positive displacement the rotation can be increased dramatically without cavitation. This pump is an improvement over centrifugal pumps for head pressure, power and cost, and can also provide power transmission by jet action. By the use of multiple discharge ports, if at the same isobar, power is increased, and by the use of multiple discharge ports at different isobars or different axial locations, pumping efficiency is increased when matched to a specific drive power in conditions of changing pressure and flow requirements.

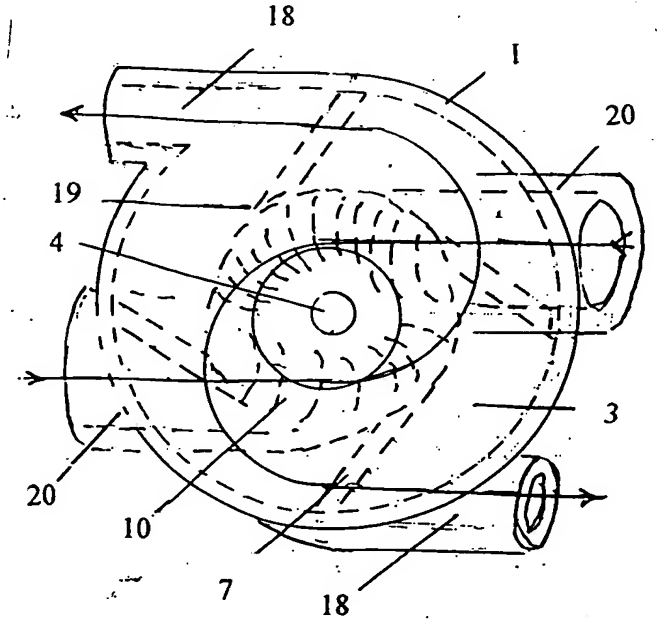

FIG 6A